

Application No.: 10/817,579

Docket No.: JCLA12120

## REMARKS

### Present Status of the Application

Claims 1-17 remain pending of which claims 1, 6 and 13 have been amended and claims 3-4 and 15-16 have been canceled without prejudice or disclaimer, to more explicitly describe the claimed invention. More specifically, the subject matter of claim 4 has been incorporated into claims 1, 6 and 13. Therefore, it is believed that no new matter adds by way of amendment to claims or otherwise to the application.

In the outstanding Office Action, claims 1-2, 5-8 and 12 were rejected under 35 U.S.C. 102(b) as being anticipated by Yamada et al. (US-6,858,277, herein after Yamada); claims 3-4 and 9-11 were rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada; and claims 1-17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Moore et al. (US-20050007852, hereinafter Moore) in view of Yamada or claims 13-17 were rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of Moore.

For at least the following reasons, Applicant respectfully submits that claims 1-3, 5-14 and 17 are in proper condition for allowance. Reconsideration is respectfully requested.

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**Discussion of the claim rejection under 35 USC 102**

*The Office Action rejected claims 1-2, 5-8 and 12 under 35 U.S.C. 102(b) as being anticipated by Yamada et al. (US-6,858,277, herein after Yamada).*

Applicants respectfully disagree and respectfully submit that it is well established that rejections under 35 U.S.C. 102 requires each and every elements of the rejected claims must be exactly disclosed by a single prior art reference.

The present invention is directed to a chalcogenide phase-change non-volatile memory. Instead, Yamada substantially discloses a structure of a recording layer including a chalcogenide layer, which is similar to CD-RW OR DVD-RW, and therefore cannot meet claim 1 in this regard. In other words, Yamada substantially fails to disclose a chalcogenide phase-change non-volatile memory, as required by claim 1, and therefore Yamada cannot possibly anticipate claim 1 in this regard.

Furthermore, the amended proposed independent claim 1, among other things, recites at least [*a phase-change thin film between the top electrode and the bottom electrode, wherein the phase-change thin film is a chalcogenide alloy doped with an element therein, and the element enhances a crystallization rate of the chalcogenide alloy, and wherein the mole ratio of the element within the chalcogenide alloy is lower than 10%*]. The advantage of including the element at a mole ratio of lower than 10% within the chalcogenide alloy is that at least the crystallization speed of the chalcogenide alloy can be effectively increased. Instead, Yamada substantially teaches, at col. 23, line 61 to col. 24, line 3, the crystallization speed chalcogenide

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layer increases with an increase in Sn concentration, while excessive Sn decreases stability of an amorphous state, and therefore Yamada proposes a Sn concentration in a range of 3-15%. In other words, Yamada substantially fails to teach or disclose the mole ratio of the element within the chalcogenide alloy is lower than 10%, as required by claim 1, instead Yamada substantially teaches the Sn concentration in a range of 3-15%. Therefore Yamada cannot possibly anticipate claim 1 in regard.

Therefore, Yamada substantially lacks two elements of the amended proposed claim 1 as discussed above, and therefore, Yamada cannot possibly anticipate claim 1 in this regard.

Because the amended proposed independent claim 6 also recite features that are similar to the amended proposed independent claim 1, therefore Applicants similarly submit that claim 6 also patently defines over Yamada for at least the same reasons discussed above.

Claims 2 and 5, and 7-8 and 12, which directly or indirectly depend from independent Claims 1 and 6, respectively, are also patentable over Yamada at least because of their dependency from an allowable base claim.

For at least the foregoing reasons, Applicant respectfully submits that claims 1-2, 5-8 and 12 patently define over Yamada. Reconsideration and withdrawal of above rejections is respectfully requested.

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**Discussion of the claim rejection under 35 USC 103**

1. *The Office Action rejected claims 3-4 and 9-11 under 35 U.S.C. 103(a) as being unpatentable over Yamada.*

Applicants respectfully disagree and traverse the above rejections as set forth below. Applicants respectfully submit that the limitations of claim 4 have been incorporated into claim 1 and claims 3-4 have been canceled.

Applicants respectfully submit that Yamada, at col. 23, lines 61-63, substantially teaches that the crystallization speed of chalcogenide layer increases with an increase in the Sn concentration, while an excessive Sn decreases the stability of an amorphous state of the chalcogenide layer. Accordingly, for improving both the repetition number and the stability of rewiring sensitivity, Yamada substantially proposes to use Sn in a Concentration range of about 5-10% (please see col. 24, lines 5-8). Therefore, it clear that Yamada expressly established the criticality of Sn concentration in the chalcogenide layer, which should be in a range of 5-10% to achieve better results. Thus, the teachings of Yamada cannot possibly suggest one skilled in the art to alter or modify the concentration level of Sn, as Yamada substantially teaches that it is critical not to deviate from this range. In other words, because Yamada substantially teaches Sn concentration range of 5-10% in the chalcogenide layer, which is substantially different from the claimed range of mole ratio lower than 10% of the element within the chalcogenide alloy, and therefore Yamada substantially teaches away from the claimed invention.

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Thus, Yamada substantially fails to teach or disclose the mole ratio of the element within the chalcogenide alloy is lower than 10%, as required by claim 1, and therefore claim 1 should be allowed.

Because the amended proposed independent claim 6 also recite features that are similar to the amended proposed independent claim 1, therefore Applicants similarly submit that claim 6 also patently defines over Yamada for at least the same reasons discussed above.

Claims 9-11, which directly or indirectly depend from independent Claim 6, respectively, are also patentable over Yamada at least because of their dependency from an allowable base claim.

For at least the foregoing reasons, Applicant respectfully submits that claims 1 and 9-11 patently define over Yamada. Reconsideration and withdrawal of above rejections is respectfully requested.

*2. The Office Action rejected claims 1-17 under 35 U.S.C. 103(a) as being unpatentable over Moore et al. (US-20050007852, hereinafter Moore) in view of Yamada or rejected claims 13-17 under 35 U.S.C. 103(a) as being unpatentable over Yamada in view of Moore.*

Applicants respectfully disagree and would like to point out that, as discussed above, Yamada substantially discloses a structure of a recording layer including a chalcogenide layer, which is similar to CD-RW OR DVD-RW, and therefore cannot meet claim 1 in this regard. In other words, because Yamada substantially a recording layer where memory cells, word lines and bit lines do not exist, and therefore one skilled in the art would not be motivated to combine the

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teachings of Yamada and Moore in a manner suggested by the Examiner. Furthermore, even if Yamada and Moore were combined in a manner suggested by the Examiner, still the combination would not possibly achieve the claimed invention as both Yamada and Moore substantially fail to teach, suggest or disclose the mole ratio of the element within the chalcogenide alloy is lower than 10%, as required by claims 1, 6 and 13, and therefore claims 1, 6 and 13 should be allowed.

For at least the foregoing reasons, Applicant respectfully submits that claims 1-2 and 5-17 patently define over Moore and Yamada. Reconsideration and withdrawal of above rejections is respectfully requested.

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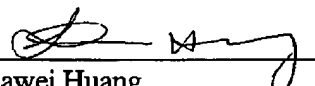
**CONCLUSION**

For at least the foregoing reasons, it is believed that all pending claims 1-2, 5-14 and 17 are in proper condition for allowance. If the Examiner believes that a conference would be of value in expediting the prosecution of this application, he is cordially invited to telephone the undersigned counsel to arrange for such a conference.

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